Claims

1. An electric power unit for electric discharge surface treatment by which electric discharge is generated between an electrode for electric discharge surface treatment and a workpiece so that a hard coat is formed on a surface of the workpiece by the energy of electric discharge, the electric power unit for electric discharge surface treatment comprising: a control means for dividing an electric discharge current pulse into a first pulse width T1 (first peak value Ip1), a second pulse width T2 (second peak value Ip2), · · · , and an n-th pulse width Tn (n-th peak value Ipn) (n is an integer 2 and more), the control means for setting the first pulse width T1 and the first peak value Ip1 so that an electric current density between the electrodes can be in a predetermined range to suppress the emission of electrode material, the control means for setting the k-th pulse width Tk and the k-th peak value Ipk ($2 \leq k \leq n$, k is an integer) so that a quantity of supply of hard coat material by the emission of electrode material can be a predetermined value determined according to a predetermined processing condition.

2. A method of electric discharge surface treatment for forming a hard coat on a surface of a workpiece by which electric discharge is generated between an electrode for electric discharge surface treatment and the workpiece

so that the hard coat is formed on the surface of the workpiece by the energy of electric discharge, the method of electric discharge surface treatment comprising the steps of: dividing an electric discharge current pulse into a first pulse width T1 (first peak value Ip1), a second pulse width T2 (second peak value Ip2), · · · , and an n-th pulse width Tn (n-th peak value Ipn) (n is an integer 2 and more); setting the first pulse width T1 and the first peak value Ip1 so that an electric current density between the electrodes can be in a predetermined range to suppress the emission of electrode material; and setting the k-th pulse width Tk and the k-th peak value Ipk ($2 \leq k \leq n$, k is an integer) so that a quantity of supply of hard coat material by the emission of electrode material can be a predetermined value determined according to a predetermined processing condition.

ABSTRACT

The first pulse width T1 and the first peak value Ip1 of the electric discharge current are set so that the electric current density between the electrode (1) and the workpiece (2) can be in a predetermined range to suppress the emission of the electrode material, and under the condition that the diameter of the electric discharge arc column (10) is sufficiently extended in the section of the first pulse width T1, the electric discharge current is increased to the second peak value Ip2 so that a quantity of supply of the hard coat material by the emission of the electrode material can be a value which has been previously set according to a predetermined processing condition. In this way, electric discharge is created between the electrodes, and the hard coat (17) is effectively formed on the workpiece (2). Therefore, it is possible to reduce the cost of surface treatment, and the tight hard coat (17) can be formed on the workpiece (2).